Analyze Media without Removing your mAb on the PATsmart™ REBEL® System

Technical Note

Background

Engineering a high producing process is one of the major goals in biotherapeutic programs. The productivity correlates to the commercial viability of a biotherapeutic, and it can be attained through a combination of appropriate cell line selection and achieving process development milestones. Media optimization is an integral step towards achieving high concentrations of a desired monoclonal antibody (mAb), but challenges arise when performing media analysis in the presence of high concentrations of a protein. Protein precipitation or protein A purifications from harvested cell media may be required to separate the mAb from the media to make the samples amenable for traditional chromatography-based strategies for media analysis. The PATsmart™ REBEL® System is not a chromatographic technique so dedicated clean up steps are not required as demonstrated below.

The Experiment

Media analysis was performed on a commercially available chemically-defined medium (without Gln) with varying levels of an IgG1 in solution. The samples were diluted 100X with the REBEL System diluent, placed into vials and run immediately. No protein precipitation or purification step was performed prior to analysis, and all samples were run for five replicates. (Figure 1)

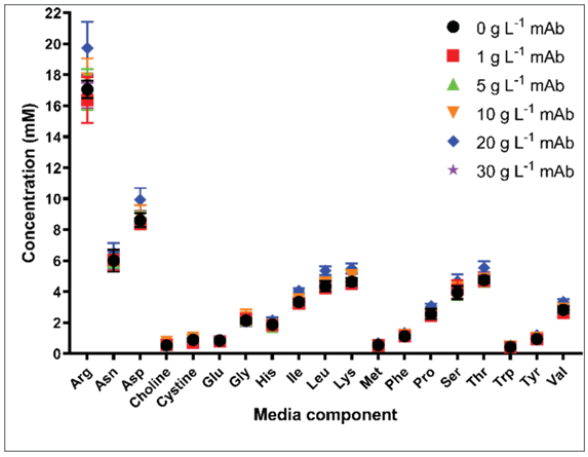

Figure 1. Concentrations of media components analyzed from chemically-defined CHO media with different concentrations of a mAb present.

Discussion

Improved cell line selection strategies and high cell density perfusion cultures have allowed for high titers in many bioprocesses. However, the high protein concentrations typical of these productive processes may interfere with traditional media analysis without additional sample preparation and clean up steps that are required to remove the excess protein from the harvest. The REBEL System has been optimized to run media analysis both with and without high levels of protein in solution, so no additional sample preparation steps are needed. As shown here, there is no interference from the increasing amounts of the mAb that were present in the cell media samples. The three highest concentration analytes measured were Arg, Asn, and Asp with concentrations of 17.44 ± 1.21 mM, 6.08 ± 0.21 mM and 8.91 ± 0.55 mM, respectively. The three lowest concentration media components were choline, Met and Trp with average concentrations of 0.64 ± 0.09 mM, 0.57 ± 0.06 mM and 0.46 ± 0.04 mM, respectively. The REBEL System is a great at-line tool for groups on the cutting edge of bioprocessing who are cultivating high titers from their bioreactors and need rapid analytics to monitor nutrient levels from their media samples.

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